"Project Financing— Your Engineer Can Help!"

James W. Brown, President
ESA Energy Systems Associates, Inc.

ABSTRACT

I'm not sure what brought on this revelation, but one day it suddenly dawned on me that our company had evolved into an *engineering firm* forced to deal with the bothersome details of running a business, as opposed to being a *business* created for the purpose of providing engineering services. As subtle as the difference may seem at first glance, these two philosophies generate completely different approaches to the way we do our daily jobs.

As we move into the second decade of the twenty-first century, we are leaving behind us (hopefully) one of the most severe recessions ever faced in the United States. Though no segment of our economy went through this time unscathed, most of us have emerged stronger and more resilient than we were before; some of us have even learned a good lesson about what it takes to survive when the good times *aren't* rolling.

Engineers are no exception. For decades, we skated through business plying our trade with little regard for where the money came from. In fact, we avoided meetings known to be primarily economic in nature, calling ourselves the "technical side" of the program, with little or no input into the "business side" of the tasks to be performed.

Brother, was that a mistake! We have now awakened in a world where projects die on the drafting table because the owner isn't convinced that our project is more valuable than the other needs he faces. *Value* rules. So we find ourselves asking if there might be a way to bring more value to the table when we place our projects in front of the owner. Is there something that the engineering profession can do to help the owner see the *value* in our recommended projects?

DON'T FORGET THE MONEY

All of us are aware of the fact that an owner with money, real money—enough money to do the job without overloading books with untenable debt—is the owner who actually signs the notice to proceed and begins the construction process. One of our clients is the owner of a major league sports franchise. He wants us to design a central plant for one of his business ventures—and he wants it done right. During several design meetings, we have had to convince him *not* to spend additional money on unnecessary options. No doubt, that project is an engineer's idea of what heaven probably looks like; however, we keep reminding ourselves that the rest of our jobs are all too grounded in the realities of the real world.

So, the thought occurred to us, "What if we could show owners the value of our project *and* show them where to find at least a portion of the money to pay the installation costs?" This requires us to get involved in the *business* of funding the projects. And if we really want to be smart about it, wouldn't it be great if we could help them generate a fund that could give us work for several years in the future? It's time for engineers to add financing of projects to their list of services. This doesn't necessarily mean that we provide the money, but it does suggest that we locate a reasonable and reliable *source* of money for the work that needs to be done.

Since our firm spends most of its time designing renovations to existing facilities, the strategy we developed applies mostly to the renovation design field. Certain components of this strategy will also work with new constructions projects, but for the most part this article focuses on energy efficient renovations in existing buildings. The goal is to generate a funding source that will not only pay for the current project but provide money for future jobs as well. When added to our conventional engineering design services, this funding mechanism has served to add the needed value that owners are looking for today. For the skeptical, let me just say that the simplicity of the developed strategy has helped us to present a "whole business" approach to projects, rather than a "solely engineering" approach. Our strategy is to:

- Ask the owner to tell you his desired return on investment (ROI), then show him that his ROI can be converted into a specific number of years (i.e., a 33% required ROI = a 3-year payback, or a 20% ROI = a 5-year payback, etc.)

- Do the preliminary investigation and determine how much of the utility budget can be saved by cost-saving energy projects that repay their installation costs within the first year (a 1-year payback period) and can continue producing those savings for several years into the future.
- Determine how much outside funding you, the engineer, can help the owner obtain that can be used to reduce his overall expense (via grants, utility rebate programs, low interest loans, etc.).
- Multiply the utility savings times the desired payback years (based on the owner's stated ROI), add the grant/rebate total available at completion of the installation, and present the total to the owner. ("*These* are the funds that add that additional value to the program—the funds available to implement your projects.")

For example, on several projects last year our firm assisted clients with preliminary energy assessment reports funded by the state energy conservation office. We received awards for utility-sponsored retro-commissioning analyses of energy intensive facilities, obtained 3% interest loans from state funding programs, and then added services required to obtain rebates available from utility suppliers (normally about 10% of the total cost) for energy efficient projects.

Where do you look for these sources of money? Well, at the risk of sounding like a voice from the past, how about starting with M&Os?

MAINTENANCE & OPERATIONS

No Cost Money

During a recent facility analysis program for one of the ten largest school districts in the country, our firm discovered $2 million in annual savings that was available from retro-commissioning (RCx) of the energy management control system (EMCS). The cost to implement these RCx findings was also around $2 million, producing a 1-year payback. Typically, the engineer would call this a job well done and move on to the next project. But what if that annual savings was re-interpreted based upon the owner's stated ROI? If it had been established that a 20% ROI was required, we could then create a 5-year program to provide infrastructure upgrades, with the first year's cost reduction being ap-

plied to the $2 million payback and the remaining 4-year period funded from a source of $2 million each year. That's an additional $8 million project! Yes, that 4-year program would require a continuous effort to keep the EMCS operating optimally, but that's also a good thing!

Although retro-commissioning is a relatively new concept for the overall construction industry, it has thus far proven to be very fruitful. The following table shows the results of 21 school campuses selected from 5 school districts surveyed and retro-commissioned by our company within the last two years:

Table 1. ES-Elementary School; MS-Middle School; HS-High School

RCx	Energy Cost Savings	Installed Cost	Payback Period
"A" ISD			(Years)
Two HS	$101,019	$45,100	0.4
"B" ISD			
Four ES	$36,605	$34,997	1.0
Two MS	$28,657	$45,735	1.6
"C" ISD			
Four ES	$40,768	$30,876	0.8
Two MS	$51,399	$27,437	0.5
"D" ISD			
Five ES	$105,835	$24,100	0.2
One HS	$21,575	$15,860	0.7
"E" ISD			
1. HS	$13,049	$3,870	0.3
2. Academy	$47,953	$38,100	0.8
TOTAL	**$446,860**	**$266,075**	**Avg. 0 .6**

"Re- or retro-commissioning"—*Make it work efficiently, effectively and productively:*

- Check the EMCS programming, line by line, making sure it runs when it should and doesn't run when it shouldn't.
  - — Compare what is thought to be happening to what really happens.
  - — Set up the trend log program and look at how the equipment really operates.

- Check the sequence of operation programmed into the schedules. Don't settle for generalized programming.
  - — Make sure compressors and fans, as well as dampers and valves, operate at the most effective time for the area served or for the service provided.

- Set the HVAC system on-time to match the ability of the system, not the experience of the operator.

- Set the off-time to match the facility U-value and to coast toward the end of the day using fans instead of compressors.

- Review work orders to find the equipment with the highest maintenance costs and add this to the renovation project.

- Determine if preventive maintenance is being done. (It saves money!)

- Provide training needed to sustain efficiency of the systems analyzed.

- Install a facility maintenance program in order to track the cost of repair for primary energy consuming systems.

- Analyze utility rates. If there are better rates available, contact the utility provider and discuss the procedure required to shift to the lower rate.

- Review and recalculate monthly bills for errors, then do it again using alternate rate schedules and see if changing rates would reduce cost.
  - — Adjust operations to match rate.
  - — If your area has deregulated utility suppliers, get information from the REPs and be ready to renegotiate.

While we were busy with our year-long surveys of over 300 different campuses within one school district, another firm was working toward a better electric rate from the REP. Our firm found $5 million per year in low cost savings, and the other firm negotiated another $5

million per year in lower electric rates and contracted that price for 3 years. Using our fund-building strategy, this district could fund:

($5M/Yr Energy cost savings x 5-year payback requirement)
$18M project cost to obtain the savings
+ ($5M/Yr from lower $/kWh x 3-year contract)
= **$22M project fund**

Note: Strike fast! Get to the decision-makers with a plan to use the savings for facility improvement ASAP, or it will be quickly devoured by other urgent needs. We found that out the hard way.

Low Cost Money

Other funds are available that aren't quite so easy to get. In fact, they may cost a good deal of money and time to process. These funds are represented by sources like the American Recovery and Reinvestment Act (ARRA), commonly referred to as *stimulus funds*.[1] Stimulus funding for energy projects is *not* free, but it is cheap!

One good resource for engineers is the DSIRE website. DSIRE is a comprehensive source of information on state, local, utility, and federal incentives and policies that promote renewable energy and energy efficiency. Established in 1995 and funded by the U.S. Department of Energy, DSIRE is an ongoing project of the N.C. Solar Center and the Interstate Renewable Energy Council. Their information base states that, at this time, there are in the United States about 795 rebate programs, 203 low interest loan programs, and 57 grant programs available that promote energy efficiency.[2] These programs are detailed on the DSIRE website.

Grant/Rebate Programs

These are not truly *free*, because these funds almost never pay for the entire project; the client still has to come up with some funds.

Suggestion: Try to negotiate higher caps on utility rebate programs. (For example, our firm is currently in negotiations with a utility supplier to raise its $100,000/client maximum rebate to more than $500,000 for a solar photo-voltaic project. Our client wants it installed, and the utility company needs the reduction in peak demand on its system. It's a win-win, if we can pull it off.)

Another example of "creating" fund reserves for our projects

comes from grants and rebates we have obtained for clients. Table 2 is a listing of funds gathered for clients during recent years.

The list of resources goes on, and I'm certain that there are many that we haven't located yet. But let me close with just a few more ideas:

- Bonds: For public entities in many parts of the country, there are tax credit bonds that allow the public entity to repay only the

Table 2

Entity	Rebate	Program	Grants
ISD A	$2,500	SCORE	Rebate
ISD B	$200,000	Standard Offer Program	Rebate
ISD C	$190,000	Standard Offer Program	Rebate
ISD D	$1,200,000	Standard Offer Program	Rebate
ISD E	$265,000	Standard Offer Program	Rebate
ISD F	$50,000	SECO GRANT	Grant
ISD G	$50,000	SECO GRANT	Grant
ISD H	$50,000	SECO GRANT	Grant
ISD J	$50,000	SECO GRANT	Grant
ISD K	$50,000	SECO GRANT	Grant
ISD L	$50,000	SECO GRANT	Grant
ISD M	$50,000	SECO GRANT	Grant
ISD N	$50,000	SECO GRANT	Grant
ISD O	$50,000	SECO GRANT	Grant
ISD P	$50,000	SECO GRANT	Grant
ISD Q	over $95,000	SCORE, SOP, COOP Rebates (Local) & School Matching Grant (Local)	Grant & Rebate
ISD R	$34,000	Standard Offer Program	Rebate
ISD S	$8,500	Standard Offer Program	Rebate
Hospital A	$35,000	Standard Offer Program	Rebate
TOTAL	**$2,530,000**		

principal while the bond holder is allowed tax credits equal to the amount of interest that would have been made. Zero percent (0%) interest is a good rate.

- Savings Accounts and Money Market Funds: It isn't difficult to show that energy efficiency is a better investment than almost any other investment available to the client's business department, but it is difficult to convince them to release that fallback money. If you can get past the "hallowed ground" theory and show them that a portion of the savings can be reinvested to replenish the fund quickly, this is easy money that is readily available for the project.
- Master Plans: Some long-term plans show a sensible plan of prioritized expenditures that reduce utility and maintenance expenses while replacing infrastructure. These plans provide a 3- to 5-year source of funding, and they remove some of the pressure from administrators concerned about high-cost emergency expenditures.
- Bond Committee: Volunteer to sit on a preliminary assessment committee assembled to analyze the needs of the community or the public entity. This is obviously a long-range investment of your time, but it pays off very well if the bond passes. This method offers the opportunity to predetermine many of the possible funding sources already mentioned, including provision of the preliminary surveys to generate a list of effective projects.

You get the idea. The point is that engineers who don't get involved in the business end of a project may soon become engineers with no business.

There are more funds available today for energy efficiency projects than we have seen in any of the past 25 years of our company's history. Bringing those funds into the project is a service that engineers can provide today. That's the kind of *value addition* that can truly help your clients.

References

[1] http://www.recovery.gov/
[2] http://www.dsireusa.org/summarytables/finee.cfm

ABOUT THE AUTHOR

James W. Brown and ESA Energy Systems Associates, Inc. have provided professional MEP engineering services, designs, commissioning, and consulting for over 27 years for more than 500 facilities around the United States. As an author and presenter of seminars for investment grade energy audits, sponsored by the Association of Energy Engineers, Mr. Brown has presented at conferences in the U.S., Hungary, Korea, Hong Kong, and Italy. He has also provided technical assistance to World Bank in three major cities in China.

James W. Brown, President
ESA Energy Systems Associates, Inc.
100 E. Main Street, Suite 201
Round Rock, Texas 78664
(512) 258-0547
jbrown@esa-engineers.com
www.esa-engineers.com